

7410

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Inventor(s): SMITH

Appl. No.: 09

422,398

Series Code: ↑

Serial No.: ↑

APR 17 2002

Filed: October 21, 1999

Hon. Commissioner of Patents  
Washington, D.C. 20231

Group Art Unit 2851

Examiner: H. NGUYEN

Atty. Dkt. P 283617

P-0276.010-US

Appl. Title: ILLUMINATION DEVICE FOR  
PROJECTION SYSTEM AND METHOD  
FOR FABRICATING

Sir:

**REPLY/AMENDMENT/LETTER****Match & Return**

Date: April 17, 2002

This is a reply/amendment/letter in the above-identified application and includes the herewith attachment of same date and subject which is incorporated hereto by reference and the signature below is treated as the signature to the attachment in absence of a signature thereto.

**FEE REQUIREMENTS FOR CLAIMS AS AMENDED**

## 1. Small Entity claim

A. ☒ NOT madeB. ☐ WithdrawnC. ☐ made herewithD. ☐ made previously

For B &amp; C

See RequiredSeparate Paper

(Pat-256)

Claims remaining after amendment	Highest number previously paid for	Present Extra	Large/Small Entity	Additional Fee	Fee Code Lg/Sm
2. Total Effective Claims	15	**minus 56	0	x \$18/\$9 = + \$0	103/203
3. Independent Claims	2	***minus 6	0	x \$84/\$42 = + \$0	102/202
4. If amendment enters proper multiple dependent claim(s) into this application for first time (leave blank if this is a reissue application) ..... add				+ \$280/\$140 = + \$0	104/204
5. Original due Date: May 8, 2002		<input type="checkbox"/> NONE			
6. Petition is hereby made to extend the original due date to cover the date this response is filed for which the requisite fee is attached		(1 mo) \$110/\$55 = (2 mos) \$400/\$200 = (3 mos) \$920/\$460 = (Usable only for ≤ 2mo.OA --- 4 mos) \$1,440/\$720= (Usable only for 30 day/1mo.OA --- 5 mos) \$1,960/\$980=	+ \$0		115/215 116/216 117/217 118/218 128/228
7. Enter any previous extension fee paid since above original due date and subtract			- \$0		
8. Extension Fee Attached			+ \$0		
9. If Terminal Disclaimer attached, add Rule 20(d) official fee .....			+ \$110/\$55		148/248
10. If IDS attached requires Official Fee under Rule 97 (c), ..... add			+ \$180		126
or if Rule 97(d) Request ..... add			+ \$180		126
11. After-Final Request Fee per rules 129(a) and 17(r) .....			+ \$740/370		146/246
12. No. of additional inventions for examination per Rule 129(b).....			x \$740/370 ea		149/249
13. Request for Continued Examination (RCE) .....			+ \$740/370		1179/1279
14. Petition fee for .....			+ \$0		
15. TOTAL FEE ENCLOSED =			+ \$0		

16. \*If the entry in this space is less than entry in next space, the "Present Extra" result is "0".  
 17. \*\*If the "Highest number previously paid for" in this space is less than 20, write "20" in this space.  
 18. \*\*\*If the "Highest number previously paid for" in this space is less than 3, write "3" in this space.

Our Deposit Account No. 03-3975)

(Our Order No. 81468 283617

CS

MS

**CHARGE STATEMENT:** The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed herewith, and which may be required under Rules 16-18 (missing or insufficiencies only) now or hereafter relative to this application and the resulting Official Document under Rule 20, or credit any overpayment, to our Accounting/Order Nos. shown above, for which purpose a duplicate copy of this sheet is attached.

This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal sheet is filed.

Query: Is appeal deadline now? If so, file Notice of Appeals separately.

Pillsbury Winthrop LLP

Intellectual Property Group

By Atty: Jack S. Barufka

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Atty/Sec: JSB/rsp

NOTE: File this cover sheet in duplicate with PTO receipt (PAT-103A) and attachments



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION OF

Confirmation No.: 5480

BRUCE W. SMITH

Group Art Unit: 2851

Application No. 09/422,398

Examiner: Hung NGUYEN

Filed: October 21, 1999

Title: ILLUMINATION DEVICE FOR PROJECTION SYSTEM  
AND METHOD FOR FABRICATING

\* \* \* \* \*

April 17, 2002

**RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS**  
**Notice of Allowance Mailed**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In response to the Notice to File Corrected Application Papers *Notice of Allowance Mailed* (copy enclosed) dated April 8, 2002, Applicants submit herewith a corrected Page 9 of the above-identified application. Applicants filed an Amendment on March 8, 2002, requesting amendment to the specification, specifically "on page 9, deleting the sentence beginning at lines 5-6."

Prompt issuance of the above-identified application is respectfully requested.

Respectfully submitted,

PILLSBURY WINTHROP LLP

By: 

Jack S. Barufka

Reg. No.: 37,087

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Enclosure: Corrected Page 9 of the Specification



UNITED STATES PATENT AND TRADEMARK OFFICE



COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
www.uspto.gov

PILLSBURY WINTHROP LLP  
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1600 TYSONS BOULEVARD  
MCLEAN, VA 22102

Serial No. : 09/422398  
Applicant B. SMITH  
Filing Date : 10/21/1999  
Date Mailed : 04/08/02

## NOTICE TO FILE CORRECTED APPLICATION PAPERS

### *Notice of Allowance Mailed*

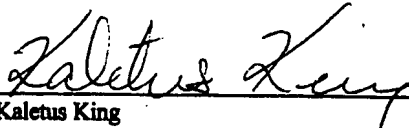
This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given 30 days from the mail date of this Notice within which to correct the informalities indicated below. A failure to reply will result in the application being ABANDONED. This period for reply is NOT extendable under 37 CFR 1.136 (a) or (b).

- **PAGE 9 OF SPECIFICATION BEGINS INCOMPLETE**

**APPLICANT MUST SUPPLY THE CORRECTED PAGE 9 WITHIN 30 DAYS OF THE MAIL DATE OF THIS NOTICE.**

*A copy of this notice **MUST** be returned with the reply. Please address response to "Box Issue Fee".*

  
Kaletus King  
Data Query  
703 305-0737

**RECEIVED**  
PILLSBURY WINTHROP LLP/VA

APR 12 2002

CL 51468 MT# 283617  
ATTY(S) PAB  
DUE 5-8-02  
DKT BY (1) \_\_\_\_\_ (2) LKS



5 **Figure 16** is a plot of the normalized image log slope, showing influence of a circular four-zone ( $\sigma_c=0.7$  and  $\sigma_r=0.2$  on a zero intensity field) with 0.1 waves of primary aberrations: astigmatism, tilt, spherical, and coma, through focus for a 130 nm features imaged with a 193 nm imaging system using a numerical aperture of 0.6.

10 **Figure 17** is a plot of the normalized image log slope, using the bi-level representation of the distributed-intensity illumination described for this invention.

**Figure 18** is a contour plot of circular gaussian zones used to optimize energy distribution in the pupil, where energy is concentrated in the center of the pupil and at  
15 off-axis angles.

**Figure 19** is a three dimensional plot of circular gaussian zones and a square limiting zone used to limit the on-axis illumination component while retaining off-axis zone energy.  
20

**Figure 20** is a perspective view of a beamsplitter illumination system with a square 25 aperture mask inserted in its pupil.

**Figure 21** shows how a square central obscuration can be included in an aperture to  
25 reduce the on-axis character of illumination and improve the performance of dense features.

**Figure 22** shows the square ring, off-axis source which delivers optimal off-axis illumination for dense features while providing on-axis illumination for more isolated  
30 features.

**Figure 23** shows how the square ring approach can be combined with the gaussian four-zone approach to emphasize corner zone effects.